NAME

CUTEST_ccfg_threaded − CUTEst tool to evaluate constraint functions values and possibly their gradients.

SYNOPSIS

CALL CUTEST_ccfg_threaded(status, n, m, X, C, jtrans, lj1, lj2, J_val, grad, thread)

For real rather than double precision arguments, instead

CALL CUTEST_ccfg_threaded_s(...)

and for quadruple precision arguments, when available,

CALL CUTEST_ccfg_threaded_q(...)

DESCRIPTION

The CUTEST_ccfg_threaded subroutine evaluates the values of the constraint functions of the problem decoded from a SIF file by the script *sifdecoder* at the point X, and possibly their gradients. The problem under consideration is to minimize or maximize an objective function $f(x)$ over all $x \in R^n$ subject to general equations $c_i(x) = 0$, $(i \in 1, \ldots, m_E)$, general inequalities $c_i^l \leq c_i(x) \leq c_i^u$, $(i \in m_E + 1, \ldots, m)$, and simple bounds $x^l \leq x \leq x^u$. The objective function is group-partially separable and all constraint functions are partially separable.

ARGUMENTS

The arguments of CUTEST_ccfg_threaded are as follows

status [out] - integer
: the outputr status: 0 for a succesful call, 1 for an array allocation/deallocation error, 2 for an array bound error, 3 for an evaluation error, 4 for an out-of-range thread,

n [in] - integer
: the number of variables for the problem,

m [in] - integer
: the total number of general constraints,

X [in] - real/double precision
: an array which gives the current estimate of the solution of the problem,

C [out] - real/double precision
: an array which gives the values of the general constraint functions evaluated at X. The i-th component of C will contain the value of $c_i(x)$,

jtrans [in] - logical
: a logical variable which should be set .TRUE. if the transpose of the constraint Jacobian is required and .FALSE. if the Jacobian itself is wanted. The Jacobian matrix is the matrix whose i-th row is the gradient of the i-th constraint function,

lj1 [in] - integer
: the actual declared size of the leading dimension of J_val (with lj1 no smaller than n if jtrans is .TRUE. or m if jtrans is .FALSE.),

lj2 [in] - integer
the actual declared size of the second dimension of J_val (with lj2 no smaller than m if jtrans is .TRUE. or n if jtrans is .FALSE.),

J_val [out] - real/double precision
a two-dimensional array of dimension (lj1, lj2) which gives the value of the Jacobian matrix of the constraint functions, or its transpose, evaluated at X. If jtrans is .TRUE., the i,j-th component of the array will contain the i-th derivative of the j-th constraint function. Otherwise, if jtrans is .FALSE., the i,j-th component of the array will contain the j-th derivative of the i-th constraint function,

grad [in] - logical
a logical variable which should be set .TRUE. if the gradient of the constraint functions are required and .FALSE. otherwise,

thread [in] - integer
thread chosen for the evaluation; threads are numbered from 1 to the value threads set when calling CUTEST_csetup_threaded.

AUTHORS

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SEE ALSO

CUTEst: a Constrained and Unconstrained Testing Environment with safe threads,
N.I.M. Gould, D. Orban and Ph.L. Toint,
Computational Optimization and Applications **60**:3, pp.545-557, 2014.

CUTEr (and SifDec): A Constrained and Unconstrained Testing Environment, revisited,
N.I.M. Gould, D. Orban and Ph.L. Toint,
ACM TOMS, **29**:4, pp.373-394, 2003.

CUTE: Constrained and Unconstrained Testing Environment,
I. Bongartz, A.R. Conn, N.I.M. Gould and Ph.L. Toint,
ACM TOMS, **21**:1, pp.123-160, 1995.

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